

# The Effect of Foot Care Demonstration Education on the Knowledge of Type 2 Diabetes Mellitus Patients at the Tilongkabila Health Center

Nurzia Delasfebrila Marukai<sup>1</sup>, Ita Sulistiani<sup>2\*</sup>, Sitti Fatimah M. Arsad<sup>3</sup>

<sup>1</sup>Mahasiswa Program Studi Ilmu Keperawatan UNG

<sup>2,3</sup>Dosen Program Studi Ilmu Keperawatan UNG

\*Corresponding Author: E-mail: [itasulistiani@ung.ac.id](mailto:itasulistiani@ung.ac.id)

---

## Article Info

### Article history:

Received 16 Dec, 2025

Revised 19 Jan, 2026

Accepted 04 Mar, 2026

---

### Keywords:

Demonstration Education, Foot Care, Knowledge, Type 2 Diabetes Mellitus

---

## ABSTRACT

Type 2 Diabetes Mellitus is a chronic disease that has the potential to cause various complications, one of which is diabetic foot ulcers which can be prevented through proper foot care. However, the low level of knowledge of people with type 2 diabetes mellitus about foot care is still a problem in primary health services. Education using the foot care demonstration method is one of the effective promotive and preventive efforts to increase the knowledge of people with diabetes mellitus related to foot care. This study aims to determine the effect of foot care demonstration education on the knowledge of patients with type 2 Diabetes Mellitus at the Tilongkabila Health Center. This research uses a design Quasi Experiment with the One group pre-post test design. A sample of 33 respondents was selected using the purposive sampling. The research instrument used a foot care knowledge questionnaire adapted from Munal (2019). Data analysis using tests Wilcoxon Signed Rank Test. The results showed that there was an increase in respondents' knowledge after the intervention with a p-value = 0.000 ( $p < 0.05$ ), which means that there is a significant difference in knowledge between before and after education. Demonstration education is effective in increasing respondents' knowledge because it involves direct observation of foot care practices, using simple aids that are easy to find, and delivered in language that suits the respondent's condition, thus facilitating understanding and strengthening the respondents' memory of the material provided.

---

## INTRODUCTION

Diabetes Mellitus (DM) is a chronic metabolic disease that occurs because the body is unable to produce enough insulin or cannot use insulin effectively, resulting in an increase in blood glucose levels (hyperglycemia) (Fajeriani, N. 2019). DM is a serious problem for the health of the general public and is one of the four priorities for non-communicable diseases that are of concern to the world (Dewi, 2022).

Based on data International Diabetes Federation (2022), there are more than 536 million adults in the world living with diabetes and it is predicted to increase to 783 million by 2045. In Indonesia, Riskesdas 2018 recorded a prevalence of DM at 10.9% and IDF estimates that there are as many as 19.5 million people suffering from DM in 2021, predicted to increase to 40.7 million people by 2045.

Based on data obtained from the Gorontalo Provincial Health Office, the number of Diabetes Mellitus (DM) patients in Gorontalo Province in the last three years is 23,950 people in 2023, 23,585 people in 2024, and 22,087 people in 2025. Specifically, in Bone Bolango Regency in 2025 there will be 2,251 patients, one of the health centers that has the highest prevalence is at the Tilongkabila Health Center, which is as many as 280 people (Gorontalo Provincial Health Office, 2023).

This high prevalence rate is a serious concern not only because of the disease itself, but also because it directly increases the risk of chronic complications due to long-term hyperglycemia conditions. Diabetes complications are generally classified into two, namely, microvascular complications (damage to small blood

---

vessels) that cause nerve damage (neuropathy) and kidneys (nephropathy), as well as macrovascular complications (damage to large blood vessels) that trigger heart disease and stroke (American Diabetes Association, 2021).

Of these two types of complications, some of the most important factors in the formation of wounds on the legs are neuropathy due to nerve damage (microvascular), which makes the loss of sensation so that the wound is often unnoticed, and peripheral artery disease due to narrowing of blood vessels (macrovascular) that inhibits the wound healing process. This combination of incomprehensible and difficult-to-heal wounds increases the risk of diabetic ulcers (Kim, 2023).

Diabetic foot ulcers are one of the most feared chronic complications. This condition is characterized by an open wound on the leg that is at risk of causing amputation. Foot ulcers also contribute to increased morbidity, mortality, and high medical costs. According to Oktalia et al. (2021), in Indonesia, the prevalence of diabetes mellitus with diabetic foot ulcers is estimated to be around 15%, with the amputation rate reaching 30%. This suggests that diabetic foot ulcers are a serious complication that requires special attention. Lira et al. (2023), also stated that foot ulcer treatment requires large resources and greatly affects the patient's quality of life.

Efforts to prevent diabetic foot ulcers can be done through independent foot care by patients. Comprehensive knowledge of foot care is a crucial aspect as outlined in the National Guidelines for Medical Services Ministry of Health (2020), which includes daily foot checks, maintaining hygiene and moisture, safe nail care, and proper selection and use of footwear. According to Sari et al. (2022), foot care that is carried out regularly and correctly has been shown to prevent the formation of wounds, detect abnormalities early, and reduce the risk of amputation.

However, foot care education so far has often only been delivered in general and verbally, so patients do not understand how to do the correct care practices. Aljaouni et al. (2024) It is reported that only about 35% of patients have good knowledge of foot care, so most patients have low knowledge. Sylvia et al. (2024), also explains that although the risk of diabetic ulcers can reach 55%, only a small percentage of patients receive adequate foot care education. Mediarti et al. (2020), also shows that structured education is able to significantly improve foot care knowledge and behavior. Therefore, a more practical educational method is needed, one of which is through demonstration, because it not only understands cognitively, but is also able to directly practice the correct foot care techniques and is proven to be more effective than verbal education (Lira et al., 2023).

This condition is also found at the level of primary health services in the region. Research in the Work Area of the Tapa Health Center Bone Bolango Regency suggests that most people with type 2 diabetes mellitus still have a low level of foot care knowledge and behavior. Some respondents have less knowledge and show suboptimal foot care behavior, which is influenced by low education levels and lack of exposure to health information. Almost all respondents stated that they had never received special education about diabetic foot care. This condition increases the risk of diabetic foot complications (Monoarfa et al., 2025).

Based on the results of initial observations and interviews conducted by researchers at the Tilongkabila Health Center, Bone Bolango Regency on 4 type 2 DM patients without active ulcers on September 6, 2025, it was found that most of the patients did not understand the correct way to care for the feet. They stated that they had received education about foot care, but it was only general and verbal so that the patient did not really understand and was difficult to remember. As a result, most of them do not regularly check their feet every day, some immediately wear footwear without drying their feet and some have had wounds but are only treated traditionally using honey sugar. This condition shows that existing education has not been effective in increasing patient knowledge, so a more practical and applicable demonstration method is needed. Research by Loy and Loy (2018), showing that health education with the demonstration method is able to significantly increase patient knowledge while strengthening the memory of the material provided.

Based on this description, the researcher is interested in conducting a study entitled "The Effect of Foot Care Demonstration Education on the Knowledge of Type 2 Diabetes Mellitus Patients at the Tilongkabila Health Center."

## RESEARCH METHODS

This research was carried out in the working area of the Tilongkabila Health Center on November 14, 2025. This study is a quantitative research with a pre-experimental method using a one-group pretest-posttest design which aims to determine the effect of foot care demonstration education on the knowledge of patients with type 2 Diabetes Mellitus at the Tilongkabila Health Center. The sampling technique uses purposive sampling in accordance with the criteria that have been set, so that the number of samples needed in this study is 33 respondents (adjusted to the rule of thumb approach).

The research instrument used a foot care knowledge questionnaire adapted from Munal (2019), consists of 15 statement items on the Guttman scale (true = 1, false = 0). Data collection was carried out through a pretest before the intervention, education was provided using PPT followed by a demonstration of foot care to the respondents, and then a posttest was carried out using the same questionnaire. Data analysis

was conducted in a univariate manner to describe the frequency distribution of respondent characteristics and knowledge levels before and after, as well as bivariate analysis using the test Wilcoxon Signed Rank Test to find out the difference in scores before and after the intervention with a significance level of  $\alpha = 0.05$ .

## RESEARCH RESULTS

Table 1 Characteristics of Respondents

Categories	n	%
<b>Age</b>		
1. Early adults (26-35 years)	1	3,0
2. Late adults (36-45 years)		
3. Early Seniors (46-55 year)	2	6,1
4. Late elderly (56-65 Year)	8	24,2
5. Senior (>65 years)	17	51,2
<b>Total</b>	5	15,2
<b>Gender</b>	<b>33</b>	<b>100</b>
1. Male		
2. Women	6	18,2
<b>Total</b>	27	81,8
<b>Education</b>	<b>33</b>	<b>100</b>
1. SD	18	54,6
2. Junior High School	7	21,2
3. High School	7	21,2
4. S1	1	3,0
<b>Total</b>	<b>33</b>	<b>100</b>
<b>Jobs</b>	<b>33</b>	<b>100</b>
1. Not Working	7	21,2
2. Teacher/retired teacher	1	3,0
3. Driver/Labourer	1	3,0
4. IRT	1	3,0
5. Farmer	22	66,7
<b>Total</b>	<b>33</b>	<b>100</b>
<b>Long Suffering from DM</b>	<b>33</b>	<b>100</b>
1. 1 year	2	6,1
2. 2-5 years	10	30,3
3. >5 years	21	63,6
<b>Total</b>	<b>33</b>	<b>100</b>
<b>Receipt History</b>		
<b>Foot Care Education</b>		
1. Never	26	78,8
2. Ever	7	21,2
<b>Total</b>	<b>33</b>	<b>100</b>

Based on Table 1 characteristics, it can be seen that the majority of respondents in the study were in the age group of the late elderly (56-65 years), which was as many as 17 respondents (51.2%). Based on gender, most of the respondents were female, namely 27 respondents (81.8%). Judging from the level of education, the majority of respondents had their last education in elementary school (SD), as many as 18 respondents (54.6%). Based on occupation, the most respondents worked as housewives (IRT), namely as many as 22 respondents (66.7%). Furthermore, based on the length of suffering from DM, the majority of respondents have suffered from DM for 2-5 years, namely 21 respondents (63.6%). Based on the history of receiving foot care education, most of the respondents had never received foot care education, namely 26 respondents (78.8%).

**Univariate Analysis****Knowledge of Type 2 Diabetes Mellitus Patients at the Tilongkabila Health Center Before Being Given Foot Care Demonstration Education**

Table 2 Patient Knowledge

Knowledge Categories	n	%
Less	21	63,7
Enough	11	33,3
Good	1	3,0
<b>Total</b>	<b>33</b>	<b>100</b>

Based on Table 2, it is known that most of the respondents had a low level of knowledge before being given foot care demonstration education, namely 21 respondents (63.7%).

**Knowledge of Type 2 Diabetes Mellitus Patients at the Tilongkabila Health Center After Being Given Foot Care Demonstration Education**

Table 3 Knowledge of Sufferers After

Knowledge Categories	n	%
Less	0	0
enough	0	0
Good	33	100
<b>Quantity</b>	<b>33</b>	<b>100</b>

Based on Table 3, it is known that all respondents as many as 33 people (100%) are in the category of good knowledge.

**Bivariate Analysis**

Table 4 Effects of Demonstration Education

Knowledge	Red	Median	Std. Dev	Min-Max	P - Value
Pre-test	51,89	53,30	12,6	33,3–80,0	<b>0,000</b>
Post-test	96,55	100,0	5,57	80,0 – 100,0	

Based on Table 3, it is known that the average value of the knowledge score before being given foot care demonstration education is 51.89, while after providing education the average knowledge demonstration increases to 96.55. In addition, the median value of the knowledge score also increased, from 53.30 in the pre-test to 100.0 in the post-test. This increase in mean and median values shows an increase in the overall knowledge of the respondents, the level of knowledge of the respondents has increased significantly after being given education on foot care demonstrations. As for the SPSS output using the Wilcoxon Signed Rank Test Asymp.sig (2-tailed) with a value of  $0.000 < 0.05$  so that it can be concluded that the hypothesis is accepted, which means that there is an effect of foot care demonstration education on the knowledge of patients with type 2 diabetes mellitus at the Tilongkabila Health Center.

**DISCUSSION****Knowledge of Type 2 Diabetes Mellitus Patients at the Tilongkabila Health Center Before Being Given Foot Care Demonstration Education**

The implementation of foot care demonstration education in this study was carried out with an approach that adjusted the condition of the respondents, especially in terms of age and level of understanding. The education provided directly using the demonstration method, namely the researcher demonstrated the steps to treat diabetic feet using media and limbs (hands) as visual aids.

To ensure that all respondents can see and understand the material well, the researcher arranged the respondents' sitting position so that it is within clear range of view. Respondents who were at the front were used as representatives during the demonstration, while other respondents were directed to pay close attention.

In addition, the researcher repeats movements and explanations slowly, accompanied by simple language so that it is easy for respondents to understand.

The researchers also engaged respondents directly by asking them to re-practice the foot care steps that had been demonstrated, such as how to check the feet, clean the feet and cut the nails correctly. This approach aims to improve respondents' understanding through hands-on experience, so that the material provided is not only passively received, but also better understood and remembered.

Based on the results of the study, before being given demonstration education on foot care, the majority of respondents with type 2 diabetes mellitus at the Tilongkabila Health Center were in the category of lack of knowledge, followed by the category of sufficient knowledge and only a small number of had good knowledge. This shows that before the intervention was carried out, most of the respondents did not have an optimal understanding of foot care in people with type 2 diabetes mellitus.

In this study, there were respondents with a category of lack of knowledge, which illustrates that most of the respondents have not been able to understand the basic principles of diabetic foot care thoroughly. This category of lack of knowledge was determined based on a knowledge score of <56% which reflects the respondents' low mastery of the basic principles of diabetic foot care, from foot examination to the selection of safe footwear.

Based on the analysis of questionnaire items, respondents with the least knowledge category experienced the most mistakes in several important aspects of foot care. Lack of knowledge is mainly in the aspects of daily foot care, nail care and the selection of footwear. According to American Diabetes Association (2025), foot care for people with diabetes mellitus, proper foot care includes daily foot checks, maintaining foot hygiene, safe nail care, and choosing appropriate footwear to prevent injuries and complications in the feet. However, based on the results of the respondents' answers to the same questionnaire item, it was still found that respondents did not know that foot examinations must be done every day and cover all parts of the foot, such as between the fingers and the soles of the feet. In addition, respondents also still do not understand how to dry their feet and the use of moisturizers that are not recommended between the toes.

In the aspect of nail care, based on the results of the analysis of questionnaire items, many respondents with less knowledge do not know that the nails of diabetics should be cut straight and not too short. According to diabetic foot care guidelines, cutting nails that are too short can cause wounds to the tissues around the nails and increase the risk of infection, especially in people with diabetes mellitus who have wound healing disorders. However, based on the results of respondents' answers to the same questionnaire item, it was still found that respondents had a misunderstanding of safe nail care, such as the assumption that not cutting nails can prevent injuries. In addition, in terms of choosing footwear, there are still respondents who consider flip-flops to be the right footwear for diabetics, even though open footwear can increase the risk of trauma and injuries to the feet so it is not recommended for diabetics mellitus (American Diabetes Association, 2025).

Theoretically, knowledge is the main basis for the formation of a person's health behavior. Notoadmodjo (2012), states that knowledge is obtained through the process of sensing an object and becomes the basis for determining individual attitudes and actions in seeking health. According to American Diabetes Association (in Elsayed et al., 2023), states that Foot care is an important part of diabetes management that must be done regularly to prevent serious injuries, infections and complications such as diabetic ulcers. Without adequate knowledge about daily foot checkups, safe nail care and the right choice of footwear, diabetics are at risk of having foot care behaviors that are not in accordance with health principles.

In the concept of nursing, Orem melalui Self Care Disability Nursing Theory explains that an individual's ability to take care of themselves is influenced by the level of knowledge and skills they have (NursingTheory.org, n.d.), People with diabetes mellitus are only able to do foot care independently if they understand the goals and correct treatment steps.

The low knowledge of respondents before being given demonstration education was also influenced by the characteristics of the respondents, especially their age. Based on the results of the study, of the 21 respondents who were in the category of lack of knowledge, most of the respondents were in the final elderly group (56-65 years old), which was 10 respondents. Followed by the early elderly age group (46-55 years) as many as 6 respondents, the elderly group (>65 years) as many as 4 respondents and only 1 respondent was in the late adult group (36-45 years). The dominance of respondents with less knowledge in the elderly age group shows that as they age, the individual's ability to understand health information tends to decrease. This is related to a decline in mild cognitive functions, such as memory and the ability to understand new information, especially health information of a technical nature. This condition can affect the respondent's ability to understand and apply information related to diabetic foot care correctly (Mardiana & Sugiharto, 2022).

In addition to the age factor, the low knowledge of the respondents was also influenced by the level of education of the last time. Based on the results of the study, of the 21 respondents who were in the category of lack of knowledge, as many as 12 respondents had the last elementary education, 6 respondents had a junior high school education, and 3 respondents had a high school education. This shows that respondents with the knowledge category are less dominated by those with a basic education level. Low education can limit an individual's ability to understand health, especially information that contains specific medical terms or

treatment procedures. Respondents with low education tend to rely on daily habits or personal experience in caring for the feet, rather than based on medically correct knowledge. This supports the finding that respondents with less knowledge are dominated by those with low levels of education.

The main supporting factor that is most crucial in explaining the low level of knowledge is the history of educational acceptance. In this study, of the 21 respondents who were in the category of lack of knowledge, 19 people had never received specific foot care education and only 2 respondents had received foot care education. Although some respondents had received diabetes-related education in general, the education provided was generally verbal or verbal without being accompanied by a direct demonstration of foot care. Education that is only verbal tends to be less effective in improving practical understanding, especially in the elderly age group.

The findings in this study are in line with research conducted by Monoarfa et al. (2025), in the Work Area of the Tapa Health Center, Bone Bolango Regency, which reported that most patients with type 2 diabetes mellitus have a low level of knowledge and behavior in foot care. The study showed that low knowledge was mainly influenced by low levels of education and lack of exposure to health information related to foot care. Almost all respondents in the study also stated that they had never received special education about diabetic foot care. This reinforces the results of current research that limited education is the main factor contributing to the low knowledge of foot care in people with type 2 diabetes mellitus before being given demonstration educational interventions

The results of this study are in line with previous research conducted by Li et al. (2025), which shows that the level of knowledge and behavior of foot care in people with diabetes, especially the elderly group, still varies. This is because their understanding is often not optimal because only a small percentage receive special education about Foot Care. These findings are also reinforced by research conducted by Sari et al. (2020), which states that education level is significantly related to foot care knowledge and behaviors in people with diabetes mellitus, where respondents with low education tend to have lower levels of knowledge.

In addition to respondents with less knowledge categories, in this study it was also found that respondents with sufficient knowledge categories were given foot care demonstration education. Based on the results of the study, as many as 11 respondents (33.3%) were in the category of sufficient knowledge. This category shows that respondents already have a basic understanding of foot care in patients with type 2 diabetes mellitus, but this understanding is not comprehensive and still needs to be strengthened so that it can be applied optimally in daily life.

Based on the analysis of questionnaire items, respondents with the knowledge category are quite generally familiar with some basic principles of foot care, such as the importance of maintaining foot hygiene and avoiding walking barefoot. However, there are still limitations in understanding certain aspects, especially related to the frequency of foot examinations, safe nail care techniques, and the selection of appropriate footwear. Some respondents do not fully understand that foot exams should be done daily and cover all parts of the foot, including between the toes and the soles of the feet, and are still hesitant to determine the safest type of footwear to use.

Theoretically, knowledge is an important part of the health learning process. According to Bloom's Taxonomy (in Ogbeide et al., 2025) explained that knowledge development includes the ability to remember, understand, and apply information into real behavior, so that respondents who only know basic information are not necessarily able to perform treatment steps correctly.

In the perspective of nursing, according to Orem (in NursingTheory.org, n.d.), Theory Self Care Deficit explained that the individual's ability to take care of himself is greatly influenced by the individual's level of knowledge and readiness. Respondents with the category of sufficient knowledge already have the initial capital to do foot care independently, but still need guidance and further education to be able to carry out foot care correctly and sustainably in accordance with the principles self-care.

Based on the characteristics of the respondents, the category of sufficient knowledge is also influenced by the age of the respondents. Most of the respondents in this category of sufficient knowledge are in the final elderly age group (56-65 years), which is as many as 6 respondents. Followed by the early elderly age group (46-55 years) as many as 2 respondents and 1 respondent each in the early adulthood, late adult, and senior age groups. In addition, of the 11 respondents who were in the category of sufficient knowledge, as many as 6 respondents had the last elementary education, 4 respondents were the last high school education and only 1 respondent was the last junior high school education. This level of education allows respondents to have basic skills in understanding health information, although it is not yet comprehensive. This shows that formal education plays a role in the formation of initial knowledge, but without special and directed education, the knowledge is still at an adequate level and is not optimal.

Judging from demographic data, in this study of 11 respondents who were in the category of sufficient knowledge, there were as many as 7 respondents who had never received education and 4 respondents who had received foot care education. However, the education has not been received in a comprehensive and structured manner. This is in line with the theory of World Health Organization (2012), explaining that education can have an effect on improving one's knowledge, so it is important for patients to receive structured and clear

education. Research Gunardi (2024), supports this by showing that planned supportive education can increase patient knowledge about foot care in people with type 2 diabetes mellitus. However, the understanding of the respondents in this study is still limited to general aspects, while in technical aspects such as nail care, daily foot checks and the selection of the right footwear are still found to be mistakes. This condition shows that foot care knowledge has not been a strong part of the self-management of diabetes mellitus, especially in patients who do not receive specialized education in a structured manner.

In addition, the research Letta et al (2023) It also reported that the level of knowledge of diabetic patients regarding foot care was influenced by the characteristics of the respondents, in particular the level of education and access to health information. Patients with low levels of education and minimal exposure to health education tend to have less knowledge about the complications of diabetic foot. These findings reinforce the results of current research that the low level of knowledge before being given demonstration education is not only due to individual factors, but is also influenced by the limited information and education received by people with type 2 diabetes mellitus.

In addition to respondents with the category of insufficient and sufficient knowledge, in this study it was also found that 1 respondent (3.0%) was in the category of good knowledge before being given education on foot care demonstrations. The category of good knowledge was determined based on a score of >76%, which indicates that the respondents had a relatively good understanding of the care of paddy's feet for people with type 2 diabetes mellitus. This respondent is 62 years old and belongs to the group of the final elderly. This condition is supported by their educational background as a retired teacher and the support of their families who work as nurses, so that respondents have better access to health information.

Even though it has been in the category of good knowledge, the results of the questionnaire analysis show that there are still several aspects of foot care that have not been optimally understood. Mistakes are still found in items related to the use of cold water when washing feet, the assumption that flip-flops are safe footwear, and not knowing that obesity is a risk factor for foot injuries.

### **Knowledge of Type 2 Diabetes Mellitus Patients at the Tilongkabila Health Center After Being Given Foot Care Demonstration Education**

After being given a demonstration education on foot care, the final knowledge measurement was carried out using the same questionnaire (post-test). Based on the results of the research presented in Table 4.8, it is known that out of a total of 33 respondents, all respondents (100%) with type 2 diabetes mellitus at the Tilongkabila Health Center are in the category of good knowledge. The category of good knowledge in this study was determined based on a score of >76% which indicates that the respondents had an adequate understanding of the principles and correct steps of foot care.

These results show that after the education was provided, there was an improvement in the overall level of knowledge of the respondents. Respondents not only understand the basic concepts of foot care, but are also able to recognize and explain practical steps of foot care, such as daily foot checks, nail care, maintaining foot hygiene, and choosing safe footwear for people with type 2 diabetes mellitus. This condition illustrates that the information received by respondents can be understood well and absorbed optimally.

In this study, there was 1 respondent who before being given education had been in the category of good knowledge, but after being given demonstration education, the respondents were still in the same category of knowledge, but showed an increase in the number of correct answers, namely from 12 correct items in the pre-test to 15 correct items in the post-test. This shows that demonstration education not only maintains the level of knowledge of the respondents, but also improves the understanding of the material that has not been mastered optimally before.

Based on the analysis of questionnaire items, in the pre-test, respondents were still wrong in several aspects, namely considering washing feet using cold water to be allowed, not knowing that obesity is a triggering factor for diabetic wounds and considering sandals as the right footwear for diabetics. After being given demonstration education, respondents were able to understand and answer all of the items correctly. This is able to correct misunderstandings even though the respondents have had a good knowledge category before.

In general, the description of the respondents' knowledge after being given foot care demonstration education showed excellent results. All respondents were in the good category, which indicates that demonstration education made a positive contribution to increasing respondents' knowledge about foot care in patients with type 2 diabetes mellitus.

### **The Effect of Foot Care Demonstration Education on the Knowledge of Patients with Type 2 Diabetes Mellitus at the Tilongkabila Health Center**

Based on the results of the study, it showed that the effect of foot care demonstration education on the knowledge of patients with type 2 diabetes mellitus at the Tilongkabila Health Center obtained the results of the Wilcoxon Signed Rank Test with a p-value of 0.000 (<0.05). These results empirically prove that there is a significant influence of providing education on the demonstration method of foot care on the knowledge of patients with type 2 diabetes mellitus at the Tilongkabila Health Center. The increase in knowledge can be seen

from the increase in the average (mean) knowledge score, which is 51.89 (poor/sufficient category) during the pre-test to 96.55 (good category) during the post-test. The increase in post test scores that reached a significant number proves that education through demonstrations is a very effective and targeted approach for respondents, especially in bridging learning barriers such as age limitations and low education.

The success of this knowledge increase is influenced by the advantages of the demonstration method that allows respondents to see, hear, and practice foot care steps firsthand, so that previously difficult concepts become easy to understand and remember. This is reinforced by research conducted by Fajeriani et al (2019), showing that education with the demonstration method significantly improves patient knowledge, especially for patients who were previously less familiar with the material and participants who were poorly educated.

The change in the level of knowledge of the respondents from the low and sufficient category to the good category after being given foot care demonstration education showed that the educational method used was able to bridge the limitations of the respondents' initial understanding. Respondents who were previously in the category of less knowledge generally experienced obstacles in understanding the concept of foot care due to the factors of old age, low level of education, and lack of experience in receiving practical health education. Through the demonstration method, information that was originally abstract becomes concrete and easy to understand because respondents can see directly, practice, and get immediate feedback on the mistakes made. Meanwhile, respondents with the knowledge category were sufficiently given reinforcement to the knowledge they had before, so that the understanding that was still partial became more complete and structured. This condition explains why after the demonstration educational intervention, all respondents showed an increase in knowledge to reach the good category.

In addition, the effectiveness of the demonstration method in this study is also influenced by the reaffirmation of educational materials during the learning process in the field. The researcher not only conducted a one-way demonstration, but also repeated the material using the hands, showed the foot care steps slowly, and adjusted the position of the respondents so that they could clearly see each stage of the demonstration. This approach helps ensure that all respondents, especially the elderly, can follow the education process optimally despite having limited vision, memory and education level.

Other supporting factors are the use of simple and relevant tools to everyday life, such as small mirrors, soft soaps, containers and towels, making the material relevant to everyday life so that it is easy to apply at home, and facilitating technical understanding that was previously difficult. In addition, those who have received previous education can recall old information (recal) and relate it to new demonstrations, so that old and new understandings reinforce each other.

The success of increasing respondents' knowledge was also influenced by the respondents' active involvement during the education process. Respondents were given the opportunity to ask questions and take a close look at every detail of the treatment steps from how to test the water temperature to cleaning between the fingers proven to be able to minimize learning obstacles that usually arise due to low education level factors. Thus, the description of the respondents' knowledge that is completely in the good category shows that the demonstration method by utilizing existing household facilities is a very targeted educational instrument. This not only increases the health literacy of DM patients, but also fosters the confidence of respondents to make efforts to prevent leg injury complications in an ongoing manner in their respective home environments.

Theoretically, this finding can be explained through the principle Adult Learning Theory (in Taylor & Hamdy, 2013), this theory states that learning in adult individuals is more effective when the material is delivered through active involvement and direct experience, so that the information provided is easier to understand and recall when it is practically relevant to their daily lives. In addition, according to the theory Health Belief Model, explains that an individual's belief in disease risk and the benefits of preventive measures plays an important role in receiving health information. In the context of foot care education in patients with type 2 diabetes mellitus, respondents' understanding of the risks of complications and the benefits of correct treatment encourages respondents to better absorb and understand the educational information provided.

The results of this study are in line with the research Nasution et al. (2022), which states that the level of comprehension through the demonstration method can reach 90%, far beyond the static reading medium which only hovers around 40%. This is also supported by S researchadale et al. (2023), which states that this drastic increase in score proves that the demonstration method is the most responsive intervention for people with type 2 diabetes in health centers.

Based on this description, it can be concluded that foot care demonstration education not only plays a role in significantly increasing respondents' knowledge, but also builds cognitive competence that is the basis for patients to carry out foot care independently at home.

## CONCLUSION

Based on the results of research that has been conducted at the Tilongkabila Health Center, it can be concluded that the level of knowledge of people with type 2 diabetes mellitus before being given foot care demonstration education is mostly in the category of lack and adequate. After being given foot care demonstration education, all respondents showed an increase in the level of knowledge to be in the good

category. The results of this study show that foot care demonstration education has an influence on increasing the knowledge of people with type 2 diabetes mellitus about foot care. Not just limited to measuring knowledge

## REFERENCES

- A. Wawan, D. M. (2017). Theory and Measurement of human knowledge, attitudes and behaviors. Medical Nun.
- Alfaqih, M. R., HS., A. A., & Khayudin, B. A. (2021). Management of Diabetes Mellitus. Guepedia. [https://www.google.co.id/books/edition/Manajemen\\_Penatalaksanaan\\_Diabetes\\_Melli/ut1YEAAAQB\\_AJ?hl=id&gbpv=1](https://www.google.co.id/books/edition/Manajemen_Penatalaksanaan_Diabetes_Melli/ut1YEAAAQB_AJ?hl=id&gbpv=1)
- Aljaouni, M. E., Alharbi, A. M., & Al-Nozha, O. M. (2024). Knowledge and Practice of Foot Care among Patients with Diabetes Attending Diabetes Center, Saudi Arabia. *Healthcare (Switzerland)*, 12(13), 1–12. <https://doi.org/10.3390/healthcare12131244>
- Alzamani, L. M. H. I., Marbun, M. R. Y., Purwanti, M. E., Salsabilla, R., & Rahmah, S. (2022). Chronic Ulcers: Recognizing Decubitus Ulcers and Diabetic Ulcers. *SYNTAX FUSION*, 2(02), 1–23.
- American Diabetes Association. (2021). Microvascular complications and foot care: Standards of medical care in diabetes—2021. *Diabetes Care*, 44(January), S151–S167. <https://doi.org/10.2337/dc21-S011>
- American Diabetes Association. (2025). 12. Retinopathy, Neuropathy, and Foot Care: Standards of Care in Diabetes-2026. *Diabetes Care*, 49(Supplement\_1), S261–S276. <https://doi.org/10.2337/dc26-S012>
- Anggreni, D. (2022). STIKes Majapahit Mojokerto Publisher of Textbooks.
- Anna Giorgi. (2023). Diabetic Foot: Charting the Course of the Effect on Feet. *Verywellhealth*. [https://www.verywellhealth.com/diabetic-foot-7967121?utm\\_source=chatgpt.com](https://www.verywellhealth.com/diabetic-foot-7967121?utm_source=chatgpt.com)
- Anugerah, M. R. A. B. A. K. (2022). *Manajemen\_Penatalaksanaan\_Diabetes\_Melli: Vol. vol 1* (pp. 1–129). [https://www.google.co.id/books/edition/Manajemen\\_Penatalaksanaan\\_Diabetes\\_Melli/ut1YEAAAQB\\_AJ?hl=id&gbpv=1&dq=komplikasi+dm&printsec=frontcover](https://www.google.co.id/books/edition/Manajemen_Penatalaksanaan_Diabetes_Melli/ut1YEAAAQB_AJ?hl=id&gbpv=1&dq=komplikasi+dm&printsec=frontcover)
- Astuti, A. K. (2020). *Quantitative Research Methods*.
- Dawi, J., Tumanyan, K., Thomas, K., Misakyan, Y., Gargaloyan, A., Gonzalez, E., Hammi, M., Thomas, S., & Venketaraman, V. (2025). Diabetic Foot Ulcers: Pathophysiology , Immune Dysregulation , and Emerging Therapeutic Strategies. *Biomedicines*, 13(5), 1–17.
- Gorontalo Provincial Health Office. (2023). *Health Profile in 2023*.
- Elsayed, N. A., Aleppo, G., Aroda, V. R., Bannuru, R. R., Brown, F. M., Bruemmer, D., Collins, B. S., Cusi, K., Das, S. R., Gibbons, C. H., Giurini, J. M., Hilliard, M. E., Isaacs, D., Johnson, E. L., Kahan, S., Khunti, K., Kosiborod, M., Leon, J., Lyons, S. K., ... Gabbay, R. A. (2023). Introduction and Methodology: Standards of Care in Diabetes—2023. *Diabetes Care*, 46(January), S1–S4. <https://doi.org/10.2337/dc23-Sint>
- Elsi Rahmadani, & Marlin Sutrisna. (2022). The Effect of Health Counseling on Posyandu on the Knowledge of Mothers Under Five in the Working Area of the Lubuk Durian Health Center, Kerkap District, North Bengkulu. *INSOLOGY: Journal of Science and Technology*, 1(2), 64–71. <https://doi.org/10.55123/insologi.v1i2.156>
- Fajeriani, N., Diani, N., & Choiruna, H. P. (2019). Education to increase knowledge about foot care for people with diabetes mellitus in Cempaka Village. *Nusantara Medical Science Journal*, 4(1), 25–31.
- Febrinasari, R. P., Sholikah, T. A., & Dyonisa Nasirochmi Pakha, and S. E. . (2020). *Diabetes Mellitus Pocket Book for the Public*. Surakarta : UNS Press. UNS Publishing and Printing (UNS Press), 1, 79.
- Gunardi, S. (2024). The Effect of Supportive Education on Foot Care Knowledge in Type 2 Diabetes Mellitus. *Indonesian Journal of Nursing Sciences*, 14(01), 15–21. <https://doi.org/10.33221/jiiki.v14i01.3218>
- International Diabetes Federation. (2022). IDF Diabetes Atlas: Global, regional and country-level diabetes prevalence estimates for 2021 and projections for 2045. *Diabetes Research and Clinical Practice*, 183, 1–23. <https://doi.org/10.1016/j.diabres.2021.109119>
- Jannah, L. R., Elvira, D., Noer, M., Decroli, E., Saputra, D., & Linosefa, L. (2024). Profile of Type 2 Diabetes Mellitus Patients with Diabetic Foot Ulcers at Dr. M. Djamil Padang Hospital in 2020-2021. *Indonesian Journal of Health Sciences*, 5(2), 121–130. <https://doi.org/10.25077/jikesi.v5i2.1114>
- Ministry of Health, R. (2020). *National Guidelines for Adult Type 2 Diabetes Mellitus Management*. 2507(February), 1–9.
- Kim, J. (2023). The pathophysiology of diabetic foot: a narrative review. *Journal of Yeungnam Medical Science*, 40(4), 328–334. <https://doi.org/10.12701/jyms.2023.00731>
- Kurnia, A. D., Masruroh, N. L., Melizza, N., Prasetyo, Y. B., & Setyowati, C. I. (2022). Effectiveness of Foot Care Against Peripheral Neuropathy Symptoms in Patients with Diabetes Mellitus. *Malahayati Nursing Journal*, 4(6), 1426–1434. <https://doi.org/10.33024/mnj.v4i6.6468>
- Lestari, Zulkarnain, Sijid, & Aisyah, S. (2021). Diabetes Mellitus: Review of Etiology, Pathophysiology, Symptoms, Causes, Methods of Examination, Treatment and Prevention. *UIN Alauddin Makassar*, 1(2), 237–241. <http://journal.uin-alauddin.ac.id/index.php/psb>

- Letta, S., Goshu, A. T., Sertsu, A., Nigussie, K., Negash, A., Yadeta, T. A., Bulti, F. A., Geda, B., & Dessie, Y. (2023). Diabetes knowledge and foot care practices among type 2 diabetes patients attending the chronic ambulatory care unit of a public health hospital in eastern Ethiopia: a cross-sectional study. *BMJ Open*, 13(11), e070023. <https://doi.org/10.1136/bmjopen-2022-070023>
- Li, G., Lu, Q., Wen, B., Qi, X., Guan, H., Li, H., Liu, J., & Ding, Y. (2025). Investigation of foot care knowledge and behaviour of older people with type 2 diabetes in Beijing community and analysis of influencing factors. *International Wound Journal*, 22(1), 1–9. <https://doi.org/10.1111/iwj.70125>
- Lira, J. A. C., Rocha, Á. S. C., Bezerra, S. M. G., Nogueira, P. C., Dos Santos, A. M. R., & Nogueira, L. T. (2023). Effects of educational technologies on the prevention and treatment of diabetic ulcers: A systematic review and meta-analysis. *Revista Latino-Americana de Enfermagem*, 31. <https://doi.org/10.1590/1518-8345.6628.3945>
- Mardiana, K., & Sugiharto. (2022). Overview of cognitive function based on the characteristics of the elderly living in the community. *Scientific Journal of Nursing*, 8(4).
- Mediarti, D., Rosnani, R., & Arifin, H. (2020). Summary Guidance for Daily Practices on Glycemic Control and Foot Care Behavior. *Journal of Ners*, 15(2), 142–147. <https://doi.org/10.20473/jn.v15i2.21127>
- Change. (2019). The Effect of Foot Care Health Education on Knowledge, Practice, and Preventive Measures for Diabetic Foot Ulcers.
- Nasif, H., Serdiani, & Sari, Y. O. (2023). Education on Integrated Patient Development Record Writing (CPPT) in Pharmacists in Hospitals (N. Duniawati (ed.)). CV Adanu Abimata. [https://www.google.co.id/books/edition/EDUKASI\\_PENULISAN\\_CATATAN\\_PERKEMBANGAN\\_P/EnjWEAAAQBAJ?hl=id&gbpv=1](https://www.google.co.id/books/edition/EDUKASI_PENULISAN_CATATAN_PERKEMBANGAN_P/EnjWEAAAQBAJ?hl=id&gbpv=1)
- Nasution, J. Dewita, Sri Siswati, & Dina Marnida Nasution. (2022). The Effect of Foot Care Health Education on Knowledge, Attitudes and Behaviors in Prevention of Diabetic Foot Ulcers. *PANNMED Scientific Journal (Pharmacist, Analyst, Nurse, Nutrition, Midwifery, Environment, Dentist)*, 17(3), 485–494. <https://doi.org/10.36911/panmed.v17i3.1449>
- Notoadmodjo, S. (2012). Health Promotion and Health Behavior. Rineka Cipta.
- NursingTheory.org. (n.d.). Self-Care Deficit Theory. *Nursing Theory*. Retrieved January 19, 2026, from <https://nursingtheory.org/theories-and-models/orem-self-care-deficit-theory>
- Nusdin. (2022). *Kenali Ulkus Diabetik Penyebab Dan Manaj*. In 2022 (p. 12). RIZMEDIA PUSTAKA INDONESIA. [https://www.google.co.id/books/edition/KENALI\\_ULKUS\\_DIABETIK\\_PENYEBAB\\_DAN\\_MANAJ/zLCqEAAAABAJ?hl=en&gbpv=1&dq=ulkusdiabetik&pg=PR4&printsec=frontcover](https://www.google.co.id/books/edition/KENALI_ULKUS_DIABETIK_PENYEBAB_DAN_MANAJ/zLCqEAAAABAJ?hl=en&gbpv=1&dq=ulkusdiabetik&pg=PR4&printsec=frontcover)
- Ogbeide, S. A., Johnson-Esparza, Y., & George, D. (2025). Applying Bloom's Taxonomy in Primary Care Behavioural Health Training. *The Clinical Teacher*, 22(3), e70099. <https://doi.org/10.1111/tct.70099>
- Oktalia, A. W., Retnaningrum, Y. R., & Khotimah, S. (2021). Relationship between Peripheral Arterial Disease and HbA1c Levels with Amputation of Extremities in Diabetic Foot Ulcer Patients at Abdul Wahab Sjahranie Hospital Samarinda. *Journal of Science and Health*, 3(5), 715–721.
- Parliani, Wahyuni, T., Ramadhaniyati, Usman, Pradika, J., & Lestari, L. (2021). *Pocket Book of Knowing Diabetes Mellitus* (H. Wijayanti (ed.)). CV Jejak, a member of IKAPI. [https://www.google.co.id/books/edition/Buku\\_Saku\\_Mengenal\\_Diabetes\\_Mellitus/P11QEAAAQBAJ?hl=id&gbpv=1](https://www.google.co.id/books/edition/Buku_Saku_Mengenal_Diabetes_Mellitus/P11QEAAAQBAJ?hl=id&gbpv=1)
- Putri, A. A., Junando, M., & Sukohar, A. (2024). Review Article: Pathophysiology and Pharmacological Therapy of Type 2 Diabetes Mellitus in Geriatric Patients. *Medical Sciences*, 2(5), 142–147.
- Raja, J. M., Maturana, M. A., Kayali, S., Khouzam, A., & Efevbokhan, N. (2023). Diabetic foot ulcer: A comprehensive review of pathophysiology and management modalities. *World Journal of Clinical Cases*, 11(8), 1684–1693. <https://doi.org/10.12998/wjcc.v11.i8.1684>
- Sadale, H. S., Riu, S. D. M., & Yahya, I. M. (2023). The Effect of Health Education with Demonstration Method on the Ability to Care for Feet in Patients with Type 2 Diabetes Mellitus at the Ranommut Manado Health Center. *Journal of Public Health*, 1(4), 133–147. <https://doi.org/https://doi.org/10.62027/praba.v1i4.38>
- Sangadji. (2023). Foot Gymnastics Health Education as an Effort to Prevent Diabetic Foot Ulcers. *Community Service: Health (JPKMK)*, 3.
- Sari, Y., Upoyo, A. S., Isworo, A., Taufik, A., Sumeru, A., Anandari, D., & Sutrisna, E. (2020). Foot self-care behavior and its predictors in diabetic patients in Indonesia. *BMC Research Notes*, 13(1), 38. <https://doi.org/10.1186/s13104-020-4903-y>
- Sari, Y., Yusuf, S., Haryanto, H., Sumeru, A., & Saryono, S. (2022). The barriers and facilitators of foot care practices in diabetic patients in Indonesia: A qualitative study. *Nursing Open*, 9(6), 2867–2877. <https://doi.org/10.1002/nop2.993>
- Setyaningsih, R. S. D., & Maliya, A. (2018). The Effect of Diabetic Foot Care Health Education with Demonstration Method on the Ability to Care for Feet in Patients with Diabetes Mellitus. *Journal of Nursing Sciences*, 11(2), 57–66. <https://doi.org/10.23917/bik.v11i2.10581>

- Simanullang, R. H., Tambunan, D. M., Sagala, L. M. B., Mu'awanah, S., Laksmi, R. W., Fatma, E. P. L., Ni, K. P., Susiladewi, Vera, I. A. M., Simbolon, & Br, C. N. N. (2025). *Oncology Nursing Textbook*. (Putu Intam). PT. Sonpedia Publishing Indonesia. [https://www.google.co.id/books/edition/Buku\\_Ajar\\_Keperawatan\\_Onkologi/\\_yBNEQAAQBAJ?hl=id&gbpv=1](https://www.google.co.id/books/edition/Buku_Ajar_Keperawatan_Onkologi/_yBNEQAAQBAJ?hl=id&gbpv=1)
- Singh, N., Shukla, S. K., John, P., Bajpai, R., Chugh, P., Sengupta, R., Pushkar, R. R., Yadav, N., Singh, N., & Sadanandan, R. (2025). Unveiling the twin epidemics of hypertension and diabetes: a cross-sectional analysis of sex-specific prevalence, risk, and hotspots in India's epidemiological transition zones. *BMC Public Health*, 25(1). <https://doi.org/10.1186/s12889-025-22983-y>
- So'o, R. W., Ratu, K., Folamauk, C. L. H., & Amat, A. L. S. (2022). Factors that affect public knowledge. *Cendana Medical Journal*, 10(1), 76–87.
- Sriyati, S. (2024). Diabetic neuropathy as a predisposing factor for the occurrence of wounds on the legs. *Scientific Journal of STIKES Yarsi Mataram*, 14(1), 46–52. <https://doi.org/10.57267/jisym.v14i1.336>
- Sukron, S. (2024). Diabetic Foot Care in Diabetic Mellitus Patients in the Prevention of Diabetic Foot Ulcer (DFU). *Medical Masks*, 12(1), 78–87. <https://doi.org/10.52523/maskermedika.v12i1.604>
- Sylvia, E., Kurdaningsih, S. V., Nuritasari, R. T., & Rasyada, A. (2024). Foot Care Education for Type 2 Diabetes Mellitus Patients. *Journal of Aisyiyah Medika*, 9(1), 178–191.
- Taylor, D. C. M., & Hamdy, H. (2013). Adult learning theories: implications for learning and teaching in medical education: AMEE Guide No. 83. *Medical Teacher*, 35(11), e1561-72. <https://doi.org/10.3109/0142159X.2013.828153>
- Utami Cahyaningtyas, & Rini Werdiningsih. (2022). Analysis of Factors of Healing Time for Diabetic Feet/Diabetic Ulcers in Type 2 Dm Patients. *Journal of Media Administration*, 7(1), 28–39. <https://doi.org/10.56444/jma.v7i1.61>
- Wahyudi, A. S., Pratiwi, I. N., Bakar, A., Tristiana, R. D., & Has, E. M. M. (2025). *Pendekatan Teori Keperawatan pada Pender*. PT. Publisher Qriset Indonesia. [https://www.google.co.id/books/edition/Pendekatan\\_Teori\\_Keperawatan\\_pada\\_Pender/cbdPEQAAQBAJ?hl=id&gbpv=0](https://www.google.co.id/books/edition/Pendekatan_Teori_Keperawatan_pada_Pender/cbdPEQAAQBAJ?hl=id&gbpv=0)
- World Health Organization. (2012). *Therapeutic patient education* (Lars Møller (ed.)).
- Yalin, L., Samiasih, A., & Armiyati, Y. (2024). Foot Care Education in the Prevention of Diabetic Foot Ulcers Laksmi Yalini. *Forikes Voice Health Research*, 15(4), 136–139. <https://doi.org/http://dx.doi.org/10.33846/sf15127>
- Yulyastuti, D. A., Maretnawati, E., & Amiruddin, F. (2021). Prevention and Treatment of Diabetic Ulcers. In *Angewandte Chemie International Edition*, 6(11), 951–952.
-